

# Sand Bathing in Oriental Pied Hornbill (*Anthracoceros albirostris*) - Social Behaviour recorded at Katarniaghat Wildlife Sanctuary, Uttar Pradesh

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## ABSTRACT

Through behavioural observations of wild birds, there are important data on the ecology, socialization, and habitat needs of the wild animals. *Anthracoceros albirostris* (Oriental Pied Hornbill) is a well-reversed hornbill bird species that is widespread in South and Southeast Asia, the behavioural data on the species are limited in India. In the wild surveys that were carried out in Katarniaghat Wildlife Sanctuary, Uttar Pradesh, a novel social behaviour was noted, sand bathing to the group of several individuals. This observation has been the earliest known account of this activity in the Terai region besides helping us understand the ethology of the hornbills. Sand bathing, behavioural form which is generally linked to feather care and controlling ectoparasites was noted both in adult males and females and, therefore, has the potential connection with ecological and social importance. The current investigation gives baseline data to a future description of behaviour, ecosystem, and conservation study of the hornbills in North India.

**Keywords:** Oriental Pied Hornbill, Forest edges, Sand Bath Behavior, Katarniaghat Wildlife Sanctuary, Protected Areas

## Introduction

The hornbills (Family: Bucerotidae) include one of the most recognisable avian species in tropical Asia and Africa with large casques, frugivorous eating habits, and diverse social structures (Datta *et al.*, 2021). In India, the Oriental Pied Hornbill (*Anthracoceros albirostris*) is very common in all Indian forests, agro forests, and urban edges with reports on populations reported in the Terai belt of Uttar Pradesh, Assam, West Bengal, and northeast India.

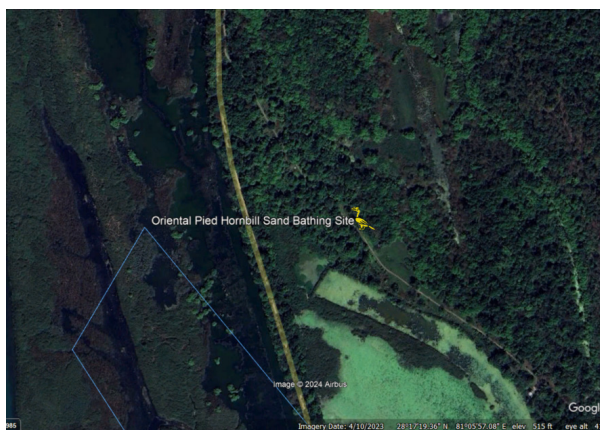
Although the breeding biology, nest ecology and foraging ecology of hornbills have been subject to

thorough research, social or maintenance behaviours including dusting or sand bathing have not been studied in so much detail. Sand bathing common in the passerines and other bird clades is used with various functions which include in maintaining the fitness of feathers, getting rid of parasites on their skin and taking heat. In the case of hornbills, plumage and casque, which are exposed to parasites and dust, sand bathing might be of great importance in helping individuals to preserve personal health conditions and social relationships.

## Study Area

Katarniaghat WS (KWS) (27.916–28.416 °N, 81.000–

81.416 °E) is located in the Upper Gangetic plain in the Terai of Bahraich district, Uttar Pradesh, India. KWS was declared as a wildlife sanctuary in 1976. It is connected with Bardia NP in Nepal via the Khata corridor. The Girwa (Karnali) river and a major canal flow through this sanctuary, which is a part of the Dudhwa Tiger Reserve. The sanctuary covers an area of 551.64 km<sup>2</sup> which has been divided into six forest ranges (i.e. Katarniaghat, Nishangarah, Dharmapur, Murthia, Kakraha and Motipur). The forest of the sanctuary comes under the tropical moist deciduous forest of the Himalayan Terai-Bhabar Region (Pipil, *et al.*, 2018). The entire area of the forest has been classified into four forest types (i) Sal forest, (ii) Teak plantation, (iii) Miscellaneous forest and (iv) Savannah grassland. The rivers Kaudiyala and Saryu and its tributaries flowing adjacent to the sanctuary provide alluvial soil to the area.



**Fig. 2.** Satellite Map of Katarniya Range at Katarniaghat Wildlife Sanctuary (KWS), Uttar Pradesh - Observational Site of the Sand Bath Behavior in Oriental Pied Hornbill

## Materials and Methods

The behaviour was recorded at Katarniaghat Wildlife Sanctuary (KWS), U.P. in the late afternoon/at the evening safari in March, 2024 between 3 pm to 6 pm. Ad libitum recording was employed to document the behaviours. “Ad libitum recording” is a behavioural observation method in which the observer records all behaviours, events, or interactions that appear noteworthy or unusual, without restricting attention to specific individuals or predefined categories. This approach is especially useful for rare, spontaneous, or unexpected behaviours, such as the sand bathing observed in this study. Observations were recorded with the help of Canon EOS 70D SLR camera, from a vantage point.

### Recorded Referenced Video Link for Social Dusting or Sand Bathing in Oriental Pied Hornbill

<https://drive.google.com/file/d/1kyx3hen17NxKczBHuMgH2H0Bimb4jJ9K/view?usp=sharing>



**Fig. 3.** Male Oriental Pied Hornbill captured during Sand Bath at Katarniaghat Wildlife Sanctuary (KWS), Uttar Pradesh. Picture Credit: ©Asif Ahmad Siddiqui

## Results

Pair of Hornbills were identified to be sand bathing for 3-7 minutes indulging in wing-spreading, rubbing of bodies and intense fanning of tails (Fig. 3&4). The sequence of behaviour in individuals was mostly uniform:

1. The birds came to the sand patch slowly and usually examined the predator beforehand.
2. The first displays of pre-bathing involved wing-fluttering and short tones.

3. Birds rolled then and rubbed their bodies in the sand, stirring the wings and tail often to get as much sand on as possible.
4. After bathing, they were found preening feathers, throwing sand off and conspecific interaction (Fig. 4).



**Fig. 4.** Sand Bath Behavior recorded in the Pair Oriental Pied Hornbill at Katarniaghat Wildlife Sanctuary (KWS), Uttar Pradesh. Picture Credit: ©Asif Ahmad Siddiqui

## Discussion

This study presents the first documented evidence of sand bathing behaviour in Oriental Pied Hornbills within the Terai region of Uttar Pradesh, highlighting its previously underreported behavioural repertoire. Sand bathing is widely recognized in avian species as a mechanism for feather maintenance, ectoparasite removal, and thermoregulation. For hornbills, which possess large, dense plumage and prominent casques, this behaviour likely contributes to plumage hygiene and overall health.

The observed social facilitation, where multiple individuals bathed in proximity without aggression, may reflect social tolerance and possible group-level hygiene benefits (Diamond, *et al.*, 2003). Such behaviours have been recorded in other hornbill species, including Great Hornbills (*Buceros bicornis*) (Tewari, *et al.*, 2019) and Indian Grey Hornbills (*Ocyrocerus birostris*), primarily in forested habitats (Sharma, *et al.*, 2020). This suggests that sand bathing, while unreported previously in *A. albirostris*, could be widespread but overlooked due to the species' cryptic behaviors and canopy-level foraging habits.

Environmental context is likely important. Bath-

ing occurred during pre-monsoon dry conditions when exposed sand patches were abundant. Similar seasonal patterns have been documented in other frugivorous and omnivorous birds, where dust or sand bathing increases during periods of low humidity and high solar exposure (Mayntz, *et al.*, 2019). This aligns with our observation that sessions occurred primarily in early morning and late afternoon.

From a conservation perspective, documenting such behaviors enhances our understanding of habitat requirements beyond foraging and nesting. Sand patches and open riverine beds may represent microhabitats essential for hornbill hygiene and social behaviour, warranting inclusion in habitat management and restoration plans. Additionally, recognition of social behaviors reinforces the importance of maintaining group cohesion and undisturbed habitats, particularly in regions experiencing anthropogenic pressures.

## Conclusion

The communication documents the initial formal observation of sand bathing in the Oriental Pied Hornbills in Katarniaghat Wildlife Sanctuary which is ecological as well as social in nature. The observed behaviours are indicative of the fact that sand bathing has hygienic, thermoregulatory, and potentially social roles. The importance of such behaviours has been identified through their recognition, and it is applicable that microhabitat aspects must be incorporated in the conservation strategies of hornbills. Broad behavioural surveys, seasonal variation and possible age/sex-related differences in maintenance behaviours should be investigated in future to draw a holistic view about the ethology of hornbills in northern India.

## Conflict of Interest

The authors declare that there is no conflict of interest.

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**Conflict of Interest-** none

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